



## **Intake of Vitamins E, C, and A and Risk of Lung Cancer The NHANES I Epidemiologic Followup Study**

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**Abstract:** The relation between the dietary intake of vitamins E, C, and A (estimated by a 24-hour recall) and lung cancer incidence was examined in the First National Health and Nutrition Examination Survey Epidemiologic Followup Study cohort of 3,968 men and 6,100 women, aged 25-74 years. During a median follow-up period of 19 years (from 1971-1975 to 1992), 248 persons developed lung cancer. Adjusted for potential confounders using Cox proportional hazards regression methods with age as the underlying time variable, the relative risk of lung cancer for subjects in the highest quartile of vitamin C intake compared with those in the lowest quartile was 0.66 (95% confidence interval (CI) 0.45-0.96). For vitamin A intake, a protective effect was observed only for its fruit and vegetable component (carotenoids) among current smokers (relative risk = 0.49, 95% CI 0.29-0.84), but this was modified by the intensity of smoking (a statistically significant effect (relative risk = 0.33, 95% CI 0.13-0.84) was observed only for those in the lowest tertile of pack-years of smoking). The vitamin E intake-lung cancer relation was modified by the intensity of smoking with a significant protective effect confined to current smokers in the lowest tertile of pack-years of smoking (relative risk = 0.36, 95% CI 0.16-0.83). Overall, there was no additional protective effect of supplements of vitamins E, C, and A beyond that provided through dietary intake. When vitamin E, vitamin C, and carotenoid intakes were examined in combination, a strong protective effect was observed for those in the highest compared with those in the lowest quartile of all three intakes (relative risk = 0.32, 95% CI 0.14-0.74). These data provide support for a protective role of dietary vitamins E and C and of carotenoids against lung cancer risk but with a modification in effects by the intensity of cigarette exposure. While smoking avoidance is the most important behavior to reduce lung cancer risk, the daily consumption of a variety of fruits and vegetables that provides a combination of these nutrients and other potential protective factors may offer the best dietary protection against lung cancer.